



Goals to Reality





Recent Successes

X-40A – Reusable Space Plane Demonstrator

AAW – Active Aeroelastic Wing

X-31 Vector – Extremely Short Takeoff and Landing Demonstrator

Bird of Prey – Stealth Technology Demonstrator

X-45A UCAV – Unmanned Combat Air Vehicle

X-50A Dragonfly – Rotorcraft to Fixed Wing Aircraft Demonstrator





BOEING®



Demonstrated...

Rapid Prototyping

**Technology Risk
Reduction**

**Operational
Capability**

**Government/Industry
Cooperation**

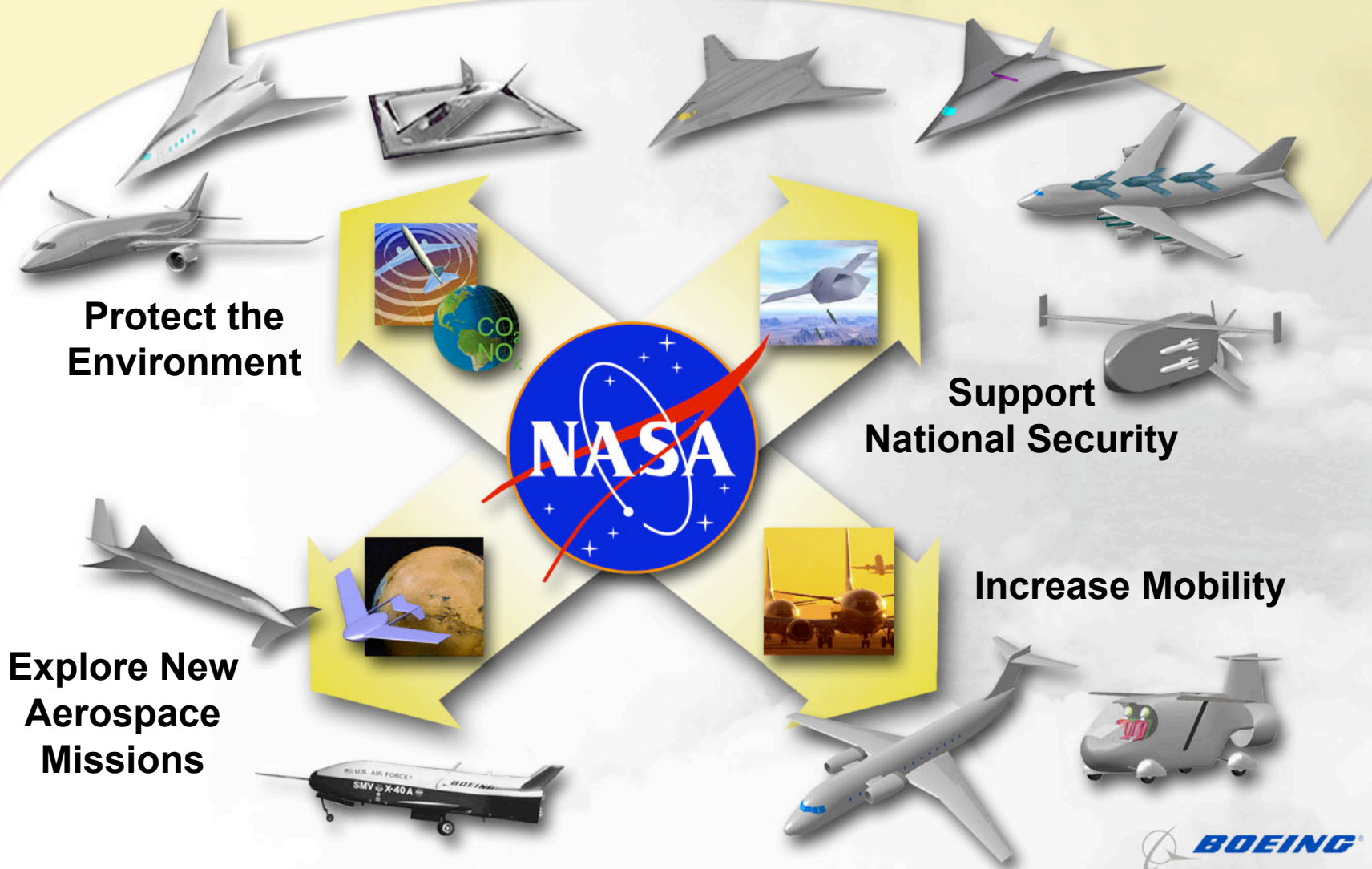
Affordability

Tangible Results







Innovative Vehicle Concepts

Respond to Emerging Mission Needs



Subsonic Air Vehicle Technology Needs

Technology	Subsonic Air Vehicle Categories			
				
Multidisciplinary tools and process for air vehicle optimization	✓	✓	✓	✓
Probabilistic structural analysis and design	✓	✓	✓	✓
Advanced low cost structures	✓	✓	✓	✓
Laminar flow control (active and passive)	✓			✓
Flow control (active and passive)	✓	✓	✓	✓
Propulsion performance (SFC and thrust / weight)	✓	✓	✓	✓
Emissions	✓		✓	
Low noise	✓		✓	
Reliability and safety	✓	✓	✓	✓
Pilot / vehicle interface	✓	✓	✓	✓
Automation / autonomy	✓	✓	✓	✓
Controlled airspace integration	✓	✓	✓	

Multiple-use technologies promote affordability of subsonic air vehicle development



Supersonic Requirements

Military Unique

- Survivability
- High payload fraction
- Varied flight regimes
- Common logistics

Common Requirements

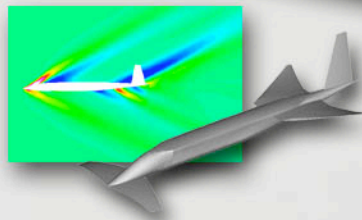
- Long range
- Efficient propulsion
- Low cost
- Improved aerodynamics
- Acoustics / noise

Commercial Unique

- Passenger accommodation
- Environmental impact
- FAA compliance
- Sonic boom reduction
- Cost of operations

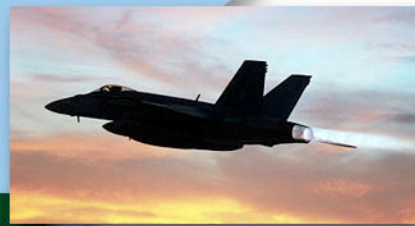
High Payoff Technologies

Low-boom
multidisciplinary
design
optimization



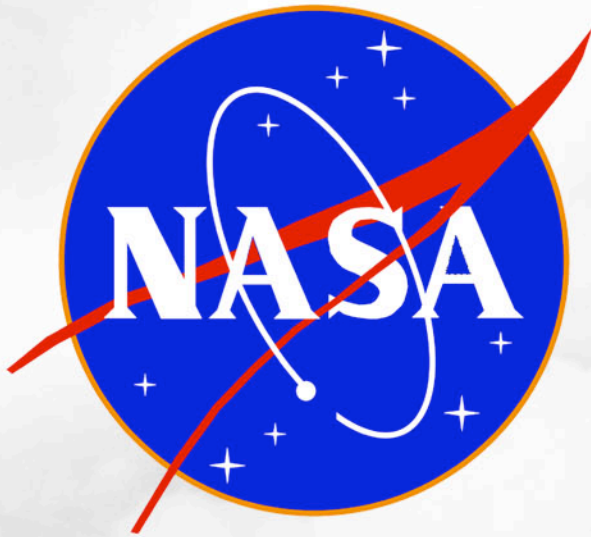
Laminar
flow control

NASA Has Proven Tradition of...



...Demonstrating
Technologies for
Next Generation
Air Vehicles





**Partnership for rapidly turning
Goals into Reality**

